

What is Claimed is:

1. A waterproof and breathable lining structure, comprising:

a sheet-like waterproof and breathable foaming cushion layer made of a composition of a predetermined amount of low density polyethylene (LDPE) and a  
5 predetermined amount of foaming agent, and

a fabric lining layer integrally adhered to one side of said cushion layer.

2. The lining structure, as recited in claim 1, further a sheet of cover layer made of fabric material integrally adhered to another side of said cushion layer.

3. The lining structure, as recited in claim 1, wherein said foaming agent is  
10 azodicarbonamide (ADCA).

4. The lining structure, as recited in claim 2, wherein said foaming agent is azodicarbonamide (ADCA).

5. The lining structure, as recited in claim 1, wherein said cushion layer is made by the steps of:

15 (a) palletizing said LDPE and said foaming agent to form a palletized raw material;

(b) extruding said palletized raw material to make a solid sheet;

(c) cross-linking said solid sheet by an electron-beam to form an irradiated matrix; and

20 (d) foaming said irradiated matrix into said sheet-like foaming cushion layer.

6. The lining structure, as recited in claim 5, wherein the step (a) further comprises the steps of:

(a-1) mixing said LDPE with said foaming agent in a mixer to form a mixture;

(a-2) extrudingly palletizing said mixture assuring master batch of each of said LDPE and said foaming agent in pellet.

5        7.    The lining structure, as recited in claim 6, wherein in the step (b), all said master batches of each of said LDPE and said foaming is put into an extruder to be extruded into a mother sheet.

8.    The lining structure, as recited in claim 7, wherein the step (d) further comprises the steps of:

(d-1) rolling said irradiated matrix; and

10        (d-2) putting said irradiated matrix into a foaming oven heated by hot air.

9.    The lining structure, as recited in claim 3, wherein said cushion layer is made by the steps of:

(a)    palletizing said LDPE and said foaming agent to form a palletized raw material;

15        (b)    extruding said palletized raw material to make a solid sheet;

(c)    cross-linking said solid sheet by an electron-beam to form an irradiated matrix; and

(d)    foaming said irradiated matrix into said sheet-like foaming cushion layer.

20        10.    The lining structure, as recited in claim 9, wherein the step (a) further comprises the steps of:

(a-1) mixing said LDPE with said foaming agent in a mixer to form a mixture;

(a-2) extrudingly palletizing said mixture assuring master batch of each of said LDPE and said foaming agent in pellet.

11. The lining structure, as recited in claim 10, wherein additives including ZnO, ZnSt and pigment are added to said mixture.

12. The lining structure, as recited in claim 11, wherein 100 phr of said LDPE, 18 phr of said ADCA, 0.1 phr of said ZnO, 0.1 phr of said ZnSt, and 1.0 phr of said pigment are  
5 put into an extruder to be extruded into a mother sheet.

13. The lining structure, as recited in claim 12, wherein the step (d) further comprises the steps of:

(d-1) rolling said irradiated matrix; and

(d-2) putting said irradiated matrix into a foaming oven heated by hot air.

10 14. The lining structure, as recited in claim 13, further a sheet of cover layer made of fabric material integrally adhered to another side of said cushion layer.

15. A process of producing a lining structure, comprising the steps of: ✓

(a) palletizing a polyethylene and a foaming agent to form a palletized raw material;

15 (b) extruding said palletized raw material to make a solid sheet;

(c) cross-linking said solid sheet by an electron-beam to form an irradiated matrix; and

(d) foaming said irradiated matrix into a sheet-like foaming cushion layer.

16. The lining structure, as recited in claim 5, wherein the step (a) further  
20 comprises the steps of:

(a-1) mixing said polyethylene with said foaming agent in a mixer to form a mixture;

(a-2) extrudingly palletizing said mixture assuring master batch of each of said polyethylene and said foaming agent in pellet.

17. The lining structure, as recited in claim 16, wherein in the step (b), all said master batches of each of said polyethylene and said foaming is put into an extruder to be  
5 extruded into a mother sheet.

18. The lining structure, as recited in claim 17, wherein the step (d) further comprises the steps of:

(d-1) rolling said irradiated matrix; and

(d-2) putting said irradiated matrix into a foaming oven heated by hot air.

10 19. The lining structure, as recited in claim 18, wherein said foaming agent is azodicarbonamide (ADCA).

20. The lining structure, as recited in claim 19, wherein additives including ZnO, ZnSt and pigment are added to said mixture.

15 21. The lining structure, as recited in claim 20, wherein 100 phr of said polyethylene, 18 phr of said ADCA, 0.1 phr of said ZnO, 0.1 phr of said ZnSt, and 1.0 phr of said pigment are put into an extruder to be extruded into a mother sheet.

22. The lining structure, as recited in claim 15, further comprising a step of integrally attaching a fabric lining layer to one side of said cushion layer.

20 23. The lining structure, as recited in claim 22, further comprising a step of integrally attaching a sheet of cover layer to another side of said cushion layer.

24. The lining structure, as recited in claim 21, further comprising a step of integrally attaching a fabric lining layer to one side of said cushion layer.

25. The lining structure, as recited in claim 24, further comprising a step of integrally attaching a sheet of cover layer to another side of said cushion layer.